II. RESOURCE DESCRIPTION

A. Location and Extent

Table Mountain NRCA lies within Skamania County, Washington. The site is approximately 3 miles west of the City of Stevenson, and 2 miles north of Bonneville Dam and the Columbia River. The majority of the NRCA lies within the Columbia Gorge National Scenic Area. The 2,837-acre NRCA encompasses portions of Sections 28, 29, 30, 31, 32 and 33 of Township 3 North, Range 7 East; and portions of Sections 4, 5, 6, 8 and 9 of Township 2 North, Range 7 East, W.M., in Skamania County. The NRCA is bounded on the south, east and northwest by federal lands. Beacon Rock State Park lies to the southwest. Privately owned lands also abut the site to the north and east. There are two active rock-mining operations adjacent to the NRCA along its southeast boundary. The Pacific Crest National Scenic Trail traverses the southwest corner of the NRCA. A power line corridor traverses the northern portion of the site, and a natural gas pipeline easement crosses the southeastern corner of the site.

B. Climate

The Coast Range of Washington and Oregon shields the Table Mountain NRCA from severe winter storms moving inland from the Pacific Ocean on the west, and the Cascade Range protects the area from the high summer and low winter temperatures of the Columbia Basin on the east. The Columbia River Gorge moderates the orographic effect of the Cascade Range somewhat by allowing air exchange between the inland and coastal areas of the state. Winds in the gorge generally blow from west to east in the summer and from east to west during the winter. Gale force winds through the gorge are common, especially in winter, when severe ice storms can also occur.

Precipitation and temperature vary with elevation, proximity to mountainous areas, position on leeward or windward slopes, and the season. At the closest weather station, Bonneville Dam, average annual precipitation is 77 inches with 80 percent falling during winter. Average temperatures at the weather station range from a low of 20 degrees Fahrenheit in January, to an average high of 89 degrees Fahrenheit in July. Temperature is expected to be lower and precipitation higher on much of the NRCA because it is higher in elevation than the Bonneville Dam weather station.

C. Physical Geography

The site's landforms are the product of the geologic processes of multiple episodes of volcanism, erosion, and mass wasting. Table Mountain and nearby Greenleaf Peak are each more than 3,400 ft in elevation. Between the two peaks lies Greenleaf Basin, with an average elevation of 2,040 feet. Greenleaf Creek flows in a southerly direction through the basin's forested wetland. There is a waterfall where the creek exits over the scarp left by the Bonneville landslide. Immediately to the southeast of Table Mountain and the adjacent Red Bluffs lies the 36 square kilometer Bonneville landslide deposit. Its topography consists of a series of uneven, roughly undulating hills and abrupt slopes, inclined in a southerly direction toward the Columbia River.

D. Geology and Soils

Table Mountain NRCA lies within the Cascade Range, which contains the most complete stratigraphic section of Tertiary and Quaternary volcanic rocks in the state. From oldest to youngest, the main bedrock units in the area have been mapped as the Ohanapecosh Formation, and the Eagle Creek Formation, which is overlain by Yakima Basalt from the Grand Ronde Flow (approximately 12 to 16 million years old). These Columbia River basalts originated from vents in southeast Washington and Northeast Oregon, and flowed to the Pacific Ocean along the ancestral bed of the Columbia River. Evidence of young lava flows, indicates that there may have been a cinder cone between Table Mountain and Greenleaf Peak that collapsed with the landslide.

Approximately 1,300 feet of the Eagle Creek formation is exposed in the slide scarp of the Bonneville landslide. Called the Red Bluffs, this scarp runs between Table Mountain and Greenleaf Peak to the northeast. The Bonneville landslide is part of a larger Cascades landslide complex, and is one of the largest examples of mass wasting in the Pacific Northwest. Debris from this landslide initially crossed and completely dammed the Columbia River creating an immense lake that stretched as far as 100 miles to the east. This temporary land bridge created by the slide is thought to have given rise to the "Bridge of the Gods" Native American legend. The slide also pushed the river channel nearly a mile to the south and constricted the channel to less than 400 meters wide. Remains of this landslide are still evident on both sides of the Columbia River.

The exact cause and date of the landslide is still in question. Some geological references attribute the cause for most of the landslides along the north side of the Columbia River to a thick clay layer which caps the Ohanapecosh Formation, which during periods of high precipitation could have provided a lubricated slip plane. Another theory is that a large earthquake triggered the slide. It is likely that there were many different processes, acting at different times and in different places that lead to the slides. The Cascades landslide complex appears to include several lobes of slide material of different ages. Based on tree ring studies it is currently believed that the Bonneville landslide took place during the mid 1400s.

The soils of the Table Mountain NRCA are derived from landslide deposits, rock outcrops, residuum, and colluviums of basalt, andesite, breccia and conglomerate, pumice and volcanic ash. The steep terrain of the majority of the NRCA results in exposed rock and rubble accounting for over 40 percent of the soil coverage of the NRCA. Soils on the southern and eastern portions of the NRCA are derived from the series of landslides that occurred on this site and support significant areas of talus.

E. Hydrology

Portions of several streams flow through Table Mountain NRCA. The largest is Greenleaf Creek, flowing southward through the site. Although this creek has seasonal tributaries within the NRCA ownership, both the headwaters and the more southerly downstream portion of the creek are outside the current ownership of the NRCA. The headwaters of Cedar Creek flow southward from the

NRCA into Hamilton Creek. The headwaters of two un-named tributaries of Rock Creek flow northward off the slopes of Greenleaf Peak.

Greenleaf Basin contains the only significant wetland within the current ownership of the NRCA. This extensive forested wetland lies in a perched basin fed by Greenleaf Creek, and supports an old growth forest community.

F. Cultural, Archaeological and Historic Resources

Table Mountain NRCA contains recognized archaeological features, which are considered to be some of the best preserved concentrations of native American rock features recorded in the state of Washington. Potential uses for these structures include food drying or storage pits, hunting blinds, vision quest ceremonies and even astronomical observation. Known sites are registered with the Office of Historic and Archaeological Preservation and additional sites may also exist.

Site observations by DNR staff and verbal communication from members of the public indicate that historic resources also exist within the Table Mountain NRCA. These include evidence of a logging railroad, log camps, old cabins, and fire lookout(s). State and federal law, and the provisions of the NRCA Statewide Management Plan provide for confidentiality of cultural, archaeological and historic sites as deemed necessary to protect the sites.

G. Plant Communities and Species

The vegetation of Table Mountain NRCA is a diverse mixture of forests, tall shrub communities, grassy balds, and sparsely vegetated rocky areas. Even though Table Mountain is west of the Cascade crest, east-side species such as heart-leaf buckwheat (*Eriogonum compositum*), fernleaf biscuitroot (*Lomatium dissectum*), spurred lupine (*Lupinus laxiflorus*), and cup clover (*Trifolium cyathiferum*) are found interspersed with west-side species. Consequently, Table Mountain is literally where east meets west.

To prioritize conservation efforts, rare species are ranked using the system developed by NatureServe, formed by The Nature Conservancy and the Natural Heritage Network. NatureServe workswith the Natural Heritage Network scientists that collect data on rare animal and plant species, which are ranked based on rarity both within the state (S) and globally (G). Ranks are whole numbers 1-5, with 1 being rarest and 5 most abundant and widespread. Use of standard ranking criteria and definitions makes natural heritage ranks comparable across species and locations. Consequently a G1 ranking has the same basic meaning whether applied to a salamander, a moss or a forest community.

Using these criteria, Table Mountain NRCA contains one very rare and threatened plant species, Howell's daisy (*Erigeron howellii*). This plant is a federal species of concern and is listed as a threatened species in Washington. In addition, the NRCA contains one plant community that is very rare, the Red Fescue Montane Herbaceous Vegetation Community. There are only three known

occurrences of this community in Washington, and an unknown number in Oregon. Because this daisy species and grassland community are quite rare, they are given considerable attention in this management plan's Management Recommendations section. Table Mountain also contains several plant communities that are vulnerable to extinction, including the Douglas-fir/oceanspray, western redcedar -western hemlock/skunk cabbage, and the western hemlock/ foamflower - western oakfern communities. The site's rarest plants and communities are listed in Table 1. Following the table is a descriptive overview of Table Mountain's rarest and most threatened plant species and plant communities.

Table 1. Rare plant species and communities found within Table Mountain NRCA.

Plant species	Status	Global and State Rank[1]
Howell's Daisy (*Erigeron howellii*)	Threatened	G2S1
Douglas' Silene (*Silene douglasii var. monantha*)	Review: Group 2	G4T?S3?
Plant communities		
Red Fescue Montane Herbaceous Vegetation		G2S2?
Douglas-Fir/Oceanspray Forest		GNRS2
Western Redcedar -Western Hemlock/Skunk cabbage Forest		G3?S2

[1]Global Rank (G) indicates relative rarity throughout the world and State Rank (S) indicates relative rarity in the State of Washington; 1 = critically imperiled, 2 = vulnerable, 3 = vulnerable to extirpation or extinction, 4 = apparently secure, and 5 = demonstrably widespread, abundant, and secure. Infraspecific taxon (subspecies or varieties) is denoted by a T. T ranks follow the same principles as global and state ranks. SR = reported from the state, but without persuasive documentation. A "?" following a "T" indicates questionable taxonomy that may reduce conservation priority and a "?" following a numeric rank denotes an inexact numeric rank (e.g., G2?).

Howell's daisy (Erigeron howellii): This perennial vascular plant reaches 20 inches in height. It is a classic daisy in appearance with a yellow center and white flower rays. In Washington, the range of Howell's daisy is confined to Skamania County, with the largest populations being found on Greenleaf Peak and Table Mountain. It is found on rocky sites (with little soil development and few competing species) on steep north-facing slopes at elevations ranging from 1,600 to 3,400 feet. It is often found with Martindale's lomatium (*Lomatium martindalei*), spreading phlox (*Phlox diffusa*), matted saxifrage (*Saxifraga bronchialis*), and western stenanthium (*Stenanthium occidentale*). It flowers in June and reproduction is presumed to be primarily sexual via seed production; pollination is thought to occur primarily via insect pollinators.

This species is threatened because there are few populations within a restricted range, and the total population size is small. The largest threats to the NRCA populations are the introduction of invasive exotic plants and trampling from hikers.

Douglas' *silene (Silene douglasii var monantha)*: Douglas' silene is a perennial with very hairy leaves and is found on open rocky slopes from near sea level to 3,000 feet in elevation. Unfortunately, little is known about the natural history of this species. In addition, the varietal status of this taxa may be in question. Douglas' silene was observed at three locations on Table Mountain and one location on Greenleaf Peak in the summer of 2000. It occurs as scattered individuals, and likely occurs at additional sites on both mountains.

Herbaceous and dwarf-shrub balds (includes red fescue montane herbaceous grassland community): Balds are open grasslands or meadows that often occur on tops of ridges and mountains, but at elevations below the subalpine meadows. Balds often occur on rocky outcrops with poorly developed soils. The herbaceous and dwarf-shrub balds on Table Mountain NRCA are probably the highest quality montane balds in the western Columbia Gorge of Washington because of their good to excellent ecological condition, substantial size, and high diversity of species and community types. They can be broken down very roughly into three types: forb-rich grasslands, juniper-kinnikinnick dwarf-shrublands, and sparse forblands.

Forb-rich grasslands (red fescue montane herbaceous grassland community type) are probably the most extensive type of bald on Table Mountain. These highly diverse plant communities are composed primarily of forbs and graminoids (grasses or sedges). The dwarf-shrub, spreading phlox (*Phlox diffusa*), is often co-dominant, though short enough in stature to appear to be a forb. Important herbaceous species in terms of dominance are red fescue (*Festuca rubra*), long-stolon sedge (*Carex inops*), prairie junegrass (*Koeleria macrantha*), Nuttall's larkspur (*Delphinium nuttallii*), nodding onion (*Allium cernuum*), nine-leaf lomatium (*Lomatium triternatum*), western groundsel (*Senecio integerrimus* var. *exaltatus*), fine-tooth penstemon (*Penstemon subserratus*), wooly sunflower (*Eriophyllum lanatum*), field chickweed (*Cerastium arvense*), and spurred lupine (*Lupinus laxiflorus*). Many other species can be prominent. The moist microsites within the forb-rich grasslands appear to be transitional to shrublands. They have very dense herbaceous cover combined with an open layer of thimbleberry (*Rubus parviflorus*) about 0.5-1.0 m tall and 5-40 percent cover.

The juniper-kinnikinnick dwarf-shrublands are dominated by either or both common juniper (*Juniperus communis*) or kinnikinnick (*Arctostaphylos uva-ursi*). Many herbaceous species found in the forb-rich grasslands and the sparse forblands also occur in this vegetation type.

The sparse forblands are varied and occur where soils are extremely shallow and total vascular plant cover is relatively low (about 10-50 percent). Martindale's lomatium (*Lomatium martindalei*), heart-leaf buckwheat (*Eriogonum compositum*), and Cascade mariposa lily (*Calochortus subalpinus*) are among the many species found in this type.

Forest Communities

Forests are the most extensive vegetation type in the NRCA and are dominated by Douglas fir

(*Pseudotsuga menziesii*) with noble fir (*Abies procera*) as a frequent co-dominant above 2,400 feet. Deciduous trees, such as bigleaf maple (*Acer macrophyllum*) and red alder (*Alnus rubra*), are found on recently disturbed sites, on old scree fields, and along riparian corridors. Western redcedar (*Thuja plicata*) and black cottonwood (*Populus trichocarpa*) dominate or co-dominate very locally on moist to wet sites such as the Greenleaf Basin. Bitter cherry (*Prunus emarginata*) is at times abundant, although usually not co-dominant, in young mixed conifer-broadleaf stands. Grand fir (*Abies grandis*) is co-dominant in some lower elevation forests east of Red Bluffs. Western hemlock (*Tsuga heterophylla*), western redcedar, and to a lesser degree, Pacific silver fir (*Abies amabilis*) are found regenerating in the lower canopy layers in some forests. Hemlock and redcedar are occasional except in old-growth forests or on some moist, protected sites. Pacific silver fir is found only on the coldest, moist sites within the Greenleaf Basin area on protected benches or gentle north facing slopes above 2,600 feet elevation. The two rarest forest communities are the Douglas-fir/oceanspray and western redcedar-western hemlock/skunk cabbage communities.

Douglas-fir/Oceanspray: The tree layer is composed of mixed-aged Douglas-fir trees with a few scattered big-leaf maple trees. The shrub layer is dominated by oceanspray (*Holodiscus discolor*). Volcanic rocks in the area are covered with moss and without vascular plants. This community is found at lower elevations on the southern slopes of Table Mountain, between previously logged forests and slopes covered by unforested volcanic rocks. Some of the very dry forests of this community type have trees of multiple age classes in the same stand due to partial mortality fires or other disturbance.

Western redcedar-western hemlock/skunk cabbage: This forested wetland is located in the flats of Greenleaf Basin. The stand consists of old western redcedar and western hemlock trees in the canopy and the understory is dominated by vine maple (Acer circinatum) and wet pockets with skunk cabbage (Lysichitum americanum). There are many standing dead redcedars that were likely killed by the Yacolt fire of 1902.

Wetlands

Greenleaf Basin is the only significant wetland on the site. Forests in the bottom of Greenleaf Basin are dominated by western redcedar and red alder. This relatively large forested wetland system collects water from throughout the basin and forms the headwaters of Greenleaf Creek. The creek flows south out of the perched basin and over a falls.

Talus, Cliffs, and Scree

Considerable areas of the NRCA are sparsely vegetated with vascular plants. These areas include talus, cliffs, scree or other recently mass-wasted soils. Most often these rocky sites are dominated by non-vascular vegetation, especially mosses and lichens. Herbs or shrubs may be a minor component of the vegetation on these sites. Sometimes, the sparsely vegetated areas occur in an intricate mosaic with shrubby and/or herbaceous vegetation.

Plant Community Condition

Old-growth forests: Several stands of old-growth forest, which are greater than 200 years of age, escaped the previous fires. The more extensive old-growth stands are the noble fir-Douglas-fir forest (western hemlock/foamflower association) on the north slope of Table Mountain and the western redcedar forest (western hemlock/devils club and western redcedar/skunk cabbage associations) in the bottom of Greenleaf Basin. The old-growth stand in Greenleaf Basin has multi-layered canopies, many large old (greater than 200 years old) trees, and much coarse woody debris. The high component of western redcedar in Greenleaf Basin is uncommon in other Columbia Gorge stands. Many trees within Greenleaf Basin were killed by the Yacolt fire of 1902 and were either salvaged after the burn or are snags today, which are scattered among the naturally regenerated forest.

Balds: All of the bald communities on Table Mountain appear to be in good to excellent ecological condition. The only non-native species of any importance is common St. John's wort (*Hypericum perforatum*), which is widespread in low abundance. An exotic species of hawkweed (*Hieracium acuminatum)* is found locally in a few balds. It is abundant in the powerlines corridor and should be monitored closely. Thin bentgrass (*Agrostis diegoensis*), a native grass that tends to increase with disturbance, is also widespread but typically occupies low percent cover. This is in contrast to some more disturbed balds elsewhere in the Columbia River Gorge where it is more abundant.

H. Wildlife

Table Mountain NRCA provides a number of important habitats and habitat structures for wildlife, including forests of different ages and associated structures, wetlands, streams, talus slopes, and cliff faces. Table Mountain is also a location where animal species typically found east of the Cascade Range mix with west-side species, resulting in a richness not normally found at a single site. For example, lazuli buntings, canyon and rock wrens have all been observed here and are species whose ranges are primarily east of the Cascade crest. Table Mountain NRCA also hosts several species listed at the federal and state level for conservation and rarity (Table 2).

Table 2. Rare wildlife species within Table Mountain, including global and state ranks and Federal and State status. Listed in approximate order of rarity and threat.

Species	Global and State Rank[1]	Federal and State Status
Larch Mountain salamander (*Plethodon larselli*)	G2S2	Federal Species of Concern, State Sensitive
Cascade torrent salamander *(Rhyacotriton cascadae)*	G3S3	Federal Species of Concern, State Candidate
Cope's giant salamander *(Dicamptodon copei)*	G3S3	State Monitor
Tailed frog (*Ascaphus truei*)	G4S4	Federal Species of Concern, State Monitor
Northern spotted owl (*Strix occidentalis caurina*)	G3T3S3	Federally Threatened, State Endangered
Peregrine falcon (*Falco peregrinus*)	G4S1B,S3N	Federal Species of Concern, State Endangered
Bald eagle (*Haliaeetus leucocephalus*)	G4S3S4B,S4N	Federally Threatened, State Threatened

[1]Global Rank (G) indicates relative rarity throughout the world and State Rank (S) indicates relative rarity in the State of Washington; 1 = critically imperiled, 2 = vulnerable, 3 = vulnerable to extirpation or extinction, 4 = apparently secure, and 5 = demonstrably widespread, abundant, and secure. Infraspecific taxon (subspecies or varieties) is denoted by a T. T ranks follow the same principles as global and state ranks. SR = reported from the state, but without persuasive documentation. A "?" following a "T" indicates questionable taxonomy that may reduce conservation priority and a "?" following a numeric rank denotes an inexact numeric rank (e.g., G2?). Breeding (B) and nonbreeding (N) are added to indicate that the rank pertains to the breeding and nonbreeding population of the species.

Amphibians and Reptiles

This area of Washington has a rich assemblage of amphibian and reptile species. Twenty-four amphibian and reptile species potentially occur within the NRCA. Ten species have been observed to date. In addition to the priority conservation species (Larch Mountain salamander, Cope's giant salamander, tailed frog, and Cascade torrent salamander), the area contains appropriate habitat for two additional species of concern, western toad and California mountain kingsnake.

Fish

All of the fish species of concern spawn outside the current NRCA boundary. Anadramous species spawn below the lowest falls of Greenleaf Creek outside the NRCA and are not found further upstream. The NRCA serves an important ecological role for fish by providing a source of clear cold water to the lower reaches of streams, which originate within the NRCA boundaries. Fortunately, the streams within the boundary are well shaded, primarily with conifer trees. As the

conifer forests continue to mature, they will provide larger woody structure to the stream.

Special Wildlife Habitats

A variety of wildlife habitats exist within the NRCA boundary. These include balds, cliffs, talus, mature deciduous forests, old growth forest, streams and riparian areas, and forested wetlands. Balds host a butterfly community found nowhere else in the state. While none of these species known from or likely to be found here are rare, the number and diversity of butterflies found from July through early September is remarkable. Talus areas are composed of weathered rock fragments and are usually located below a cliff face. Talus slopes provide a broad spectrum of thermal and moisture microclimates. Some species, such as the Larch Mountain salamander, pika and rock wren are found almost exclusively in the talus slopes within the NRCA. The forested talus slopes or the forest edges of the talus slopes are likely important habitats for the Larch Mountain salamander. A variety of potential bat habitats, from caves and crevices to large hollow snags, are present within the NRCA, but additional research is needed to document the relative importance of this area to bats. The large cave in the Yakima basalts within the outlier southeast portion of the NRCA should be surveyed for bat use.

I. Site Disturbance

Fire: Fire has been the major natural disturbance influencing the structure and composition of vegetation on the NRCA. The majority of the forests on the site experienced stand-replacement fire in the early 1900s. The Yacolt fire of 1902 and several subsequent re-burns appear to have caused much, if not all, of the fire-related tree mortality observed on the site. The most common age class of dominant trees in the young post-fire forests is 60-70 years. A 90-95 year old age class dominates a few stands on the eastern edge of the NRCA. There appears to have been a re-burn of portions of the Yacolt burn area about 70 years ago. The unlogged 70 year old forests show abundant evidence of two successive stand replacement fires: large, but relatively short, snags with charcoal on the exposed wood. These snags were old-growth Douglas-fir trees prior to 1902 that were killed by the Yacolt burn, and then charred in the re-burn. Many have fallen to the ground. Fire may have played a role in maintaining bald vegetation, by thinning or removing woody species and favoring fire-tolerant herbaceous species.

Timber harvest: Large areas of the NRCA were logged at some point within the last 80 years. Logging history on individual sites includes: (1) logged and burned about 60 years ago (fire after logging); (2) salvage logged after stand-replacement fire; (3) commercially thinned about 40 years ago (in 80-90 year old stands); and (4) high-grade logged (large Douglas-fir and western redcedar removed). Old-growth stands are relatively undisturbed by logging.

J. Land Use

During this century, timber harvest appears to have occurred at Table Mountain NRCA in at least four phases (see above). However some old growth stands are relatively undisturbed by logging. Roads of varying condition exist within the NRCA and adjacent to it. The majority of them were originally used for timber harvest. Also, adjacent rights-of-way provide access to other ownerships.

A power line corridor traverses the northern portion of the site, and a natural gas pipeline easement crosses the southeastern corner. Evidence also points to a logging railroad that existed both to the west of the Table Mountain peak and within Greenleaf Basin.

Today, the site is mainly used for hiking. The Pacific Crest Trail crosses the southwest corner of the site, and there are several user-built trails throughout the NRCA that were constructed before the land was transferred to NRCA status.